



Introduction

This section defines setup and operation procedures for the SpectraPoint™ Model 2200 LMDS (SP2200) system using SpectraPRO™ software.

SpectraPRO™ Software

The SpectraPRO software is typically installed on a laptop Personal Computer (PC), or desktop PC. The computer where SpectraPRO is installed is named the Craft Interface Device (CID). The CID can be connected to a Base Channel Group (BCG) or a Network Interface Unit (NIU). The SpectraPRO software enables an operator to set up, maintain, and make inquiries into the SP2000 equipment.

SpectraPoint EMS™ Software

Refer to the *SpectraPoint EMS Software User Guide* for detailed information concerning SpectraPoint EMS setup procedures.

The SpectraPoint EMS software is an customized extension of the Bosch Open NSÜ™ Network Management System (NMS). This software is UNIX based and runs on a workstation or PC usually located at a Network Operating Center (NOC). Many of the EMS procedures and graphics are similar to those associated with SpectraPRO software.

Setup and Operation Procedures

The SP2200 can be set up by performing the procedures listed in Table 1.

Table 1. SpectraPRO Setup Procedures

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How to Use this Manual

In this manual **bold type** is used to designate the text that appears in the SpectraPRO software displays. If a shortcut key is available it is indicated by the use of underlining a letter. For example, File indicates that pressing “ALT-F” will access the File pull-down menu. Use of the Control Key is indicated in the same way.

To access a window, a series of key clicks is performed. The shorthand for this procedure is provided in this condensed format:

Path: Main BCG>Tree>DownLink Tab>Defaults.

Using the example above, you would navigate to the main BCG window, locate the tree plane, click on the Downlink entry within the tree. Then you would click on the Defaults button within the Downlink window. In some cases there are other paths to the same windows. If a single key click does not work, try a double key click.

Appendix A of this manual provides detailed diagrams and descriptions of the SpectraPRO windows.

Appendix B of this manual provides a Sample Installation Worksheet that includes information concerning the license holder, the cell and site plans, IP address and other related information.

Appendix C of this manual provides a Sample Site Installation Form that includes information concerning the customer and the location of the equipment and other related information.

Installing SpectraPRO

To install SpectraPRO on a laptop or desktop computer, insert the Compact Disk (CD) into the CD player and using Windows® Explorer™, start the installation process by double-clicking on the setup.exe file. Follow the setup instructions.

Computer Requirements

SpectraPRO must be run on a CID, defined as a PC that meets or exceeds the specifications listed in Table 2.

Table 2. Craft Interface Device (CID) Minimum Specifications

Requirement	Minimum Specification
Computer Type	Microsoft® Pentium™ II or better laptop or desktop
Operating System	Microsoft Windows 98 or Microsoft NT™ with Service Pack 4
Clock Speed	133 MHz
RAM	64 MB
Video Resolution	800 x 600, 256 colors; 1024 x 768 or higher, strongly recommended
Hard Drive	50 MB free space
CD Devices	CD-ROM Reader
Floppy Devices	3 1/4-inch floppy (optional)
Ports	(1) RS-232, (1) Ethernet (with 10Base-T adaptor)

Explanation of SpectraPRO Graphical User Interface

The meaning of the objects in the SpectraPRO Graphical User Interface (GUI) including dialog boxes, tabs and text fields are identified by Appendix A of this manual. SpectraPRO will operate well using the default settings in most cases. It is important, however, that the user be familiar with Appendix A to make full use of SpectraPRO.

Connecting the CID to a Base Channel Group

If the CID is directly connected to a BCG without an Ethernet connection, the CID can communicate only to the equipment managed by that particular BCG. The CID can control that BCG and its related devices, including multiple NIU installations.

If the CID is connected to a Primary BCG, the CID can interface not only with its NIUs, but with its SRIUs, TXs, and RXs as well via the RS-485 cable.

If all the BCGs are connected together through an Ethernet hub, all the BCGs are said to be in the same domain. In this case, SpectraPRO can see all the BCGs. However, SpectraPRO can log into only one BCG at a time.

After the BCG and the Channel Group Cards are installed as directed in *Installation*, connect the CID to the BCG:

Connect an Ethernet cable from the CID's Ethernet port to the Ethernet port on the back of the Base Channel Group (see Figure 2).

Note: If the Channel Group Ethernet port is occupied, you may plug into a nearby Ethernet hub on the same network, or use the slower RS-232 port on the front of the Base Channel Group.

The CID now can be used to setup or otherwise configure the system as explained in the following pages of this section of the manual.

Connecting the CID to a NIU

A CID can be connected to a NIU (Network Interface Unit) at the customer premises instead of a BCG. However, the SpectraPRO software provides limited functionality when connected to a NIU. For information on using SpectraPRO while connected to a NIU, refer to the *SP2200 CPE Equipment Manual*.

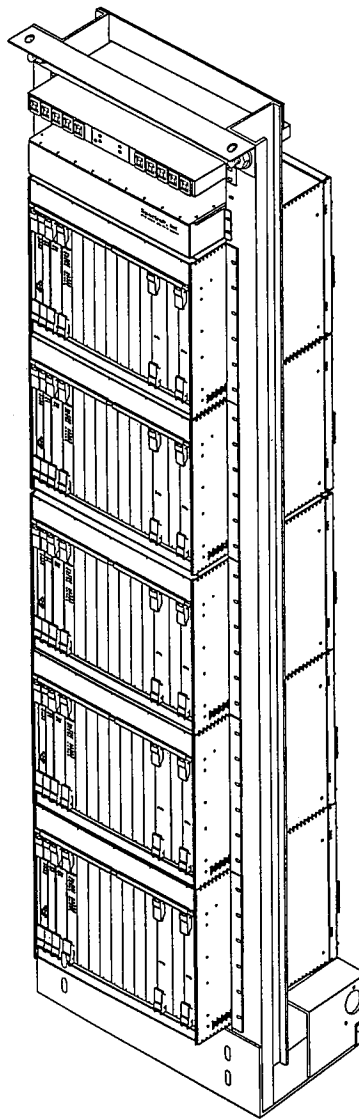


Figure 1. Relay Rack with Base Channel Groups

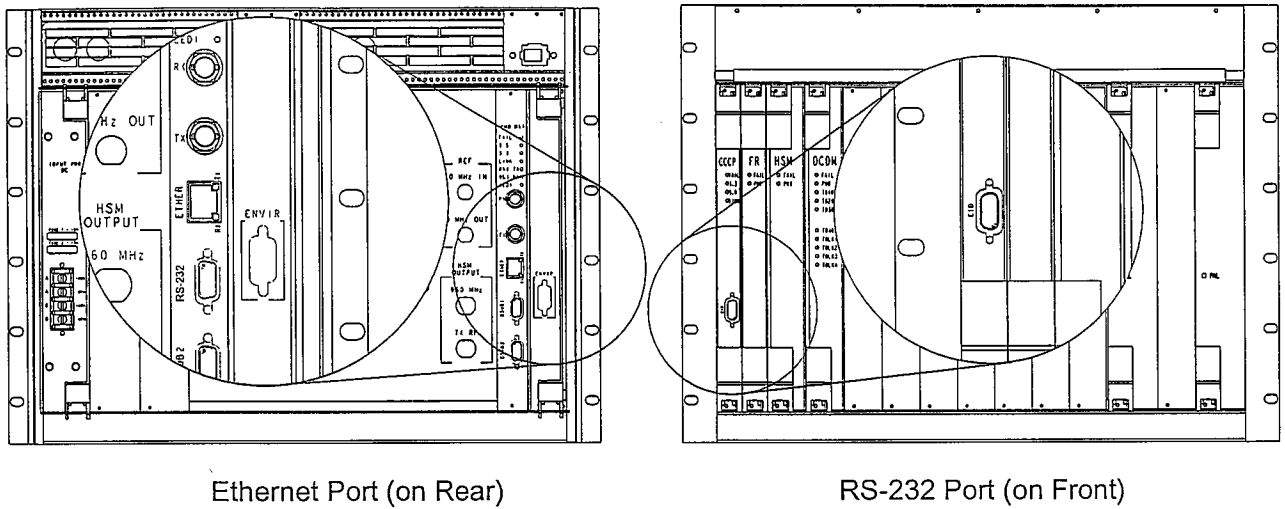


Figure 2. Ethernet and RS-232 CID Connectors

Setting Up a CID Connection



Steps

1. Run SpectraPRO using the Start menu or by double-clicking the SpectraPRO icon.
2. The Set Up CID Connection dialog window appears (see Figure 3). SpectraPRO will attempt to discover the available hosts (BCGs or NIUs).
3. If the host appears in the list, place a checkmark in the selection box on the left, then highlight the host, click the OK button and skip step 3.

Note: At least one host is required. See Appendix A for details of this and other windows.

Type	Host Name or IP	Ending Host	Subnet Mask
<input checked="" type="checkbox"/> Single Host	pc13956	N/A	N/A

Property

☒ Single Host
 ☐ A Range of Hosts
 ☐ Subnet Broadcast

Broadcast IP Address: 172 . 17 . 132 . 74

Subnet Mask: 255 . 255 . 255 . 0

Figure 3. Set Up CID Connection Dialog

4. If the desired host does not appear in the list, enter the IP address of the Host from the Installation Work Sheet or Service Order as indicated below.

Selecting a Single Host

- a) In the Property area, select the Single Host radio button. The parameter field title will display "IP Address or Hostname."
- b) Enter the IP Address or Hostname.
- c) Click **Add** and proceed to Step 5.

Selecting a Range of Hosts

- a) In the Property area, select the Range of Hosts radio button. The parameter field titles will change and two text fields will be presented: IP Address and Hostname.
- b) Enter the starting IP Address and the Ending IP Address according to the installation worksheet.
- c) Click **Add** and proceed to Step 5.

Selecting a Subnet Broadcast

- a) In the Property area, select the Subnet Broadcast radio button. The parameter field titles will change and two text fields will be presented: Broadcast IP Address and Subset Mask.
 - b) Enter the Broadcast IP Address and the Subset Mask according to the installation worksheet.
 - c) Click **Add** and proceed to Step 5.
5. In the List of Hosts, highlight the desired BCG, then click **OK**. The Initial Main Window appears (see Figure 4).

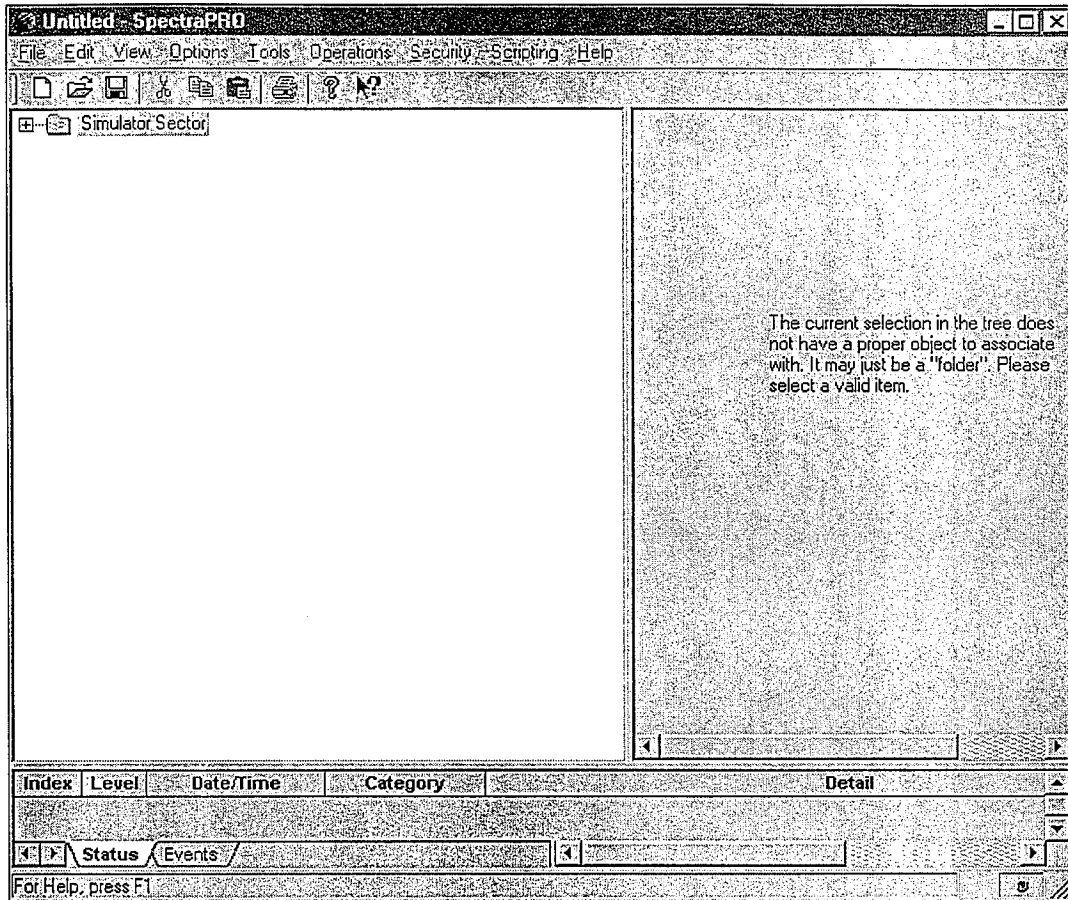


Figure 4. Initial Main Window

Logging In to a Base Channel Group



1. With the Initial Main Window window displayed appears (see Figure 4) click on the plus sign to the left of the desired host.
2. Highlight the desired BCG. The Password Dialog window appears (see Figure 5)
3. Select the tab on the Login dialog box for the appropriate connection type (refer to "Connecting the CID to a Base Channel Group." For faster communication, Ethernet is the preferred connection mode).
4. Enter the required information:
 - for Ethernet: enter your User Name and password.
 - for RS-232: your User Name, password, COM port and BAUD rate.
5. Click **OK**.
6. The SpectraPRO screen displays the Main Window for the selected Channel Group (see Figure 6). The default Channel Group tab is displayed. You are now logged in to the Base Channel Group.

This completes the procedure for Logging In to a Base Channel Group.

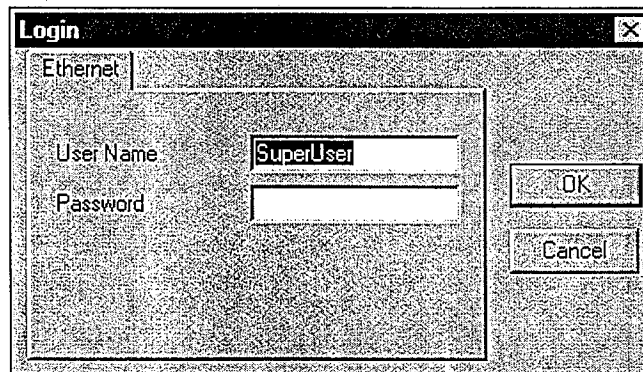


Figure 5. Login Dialog

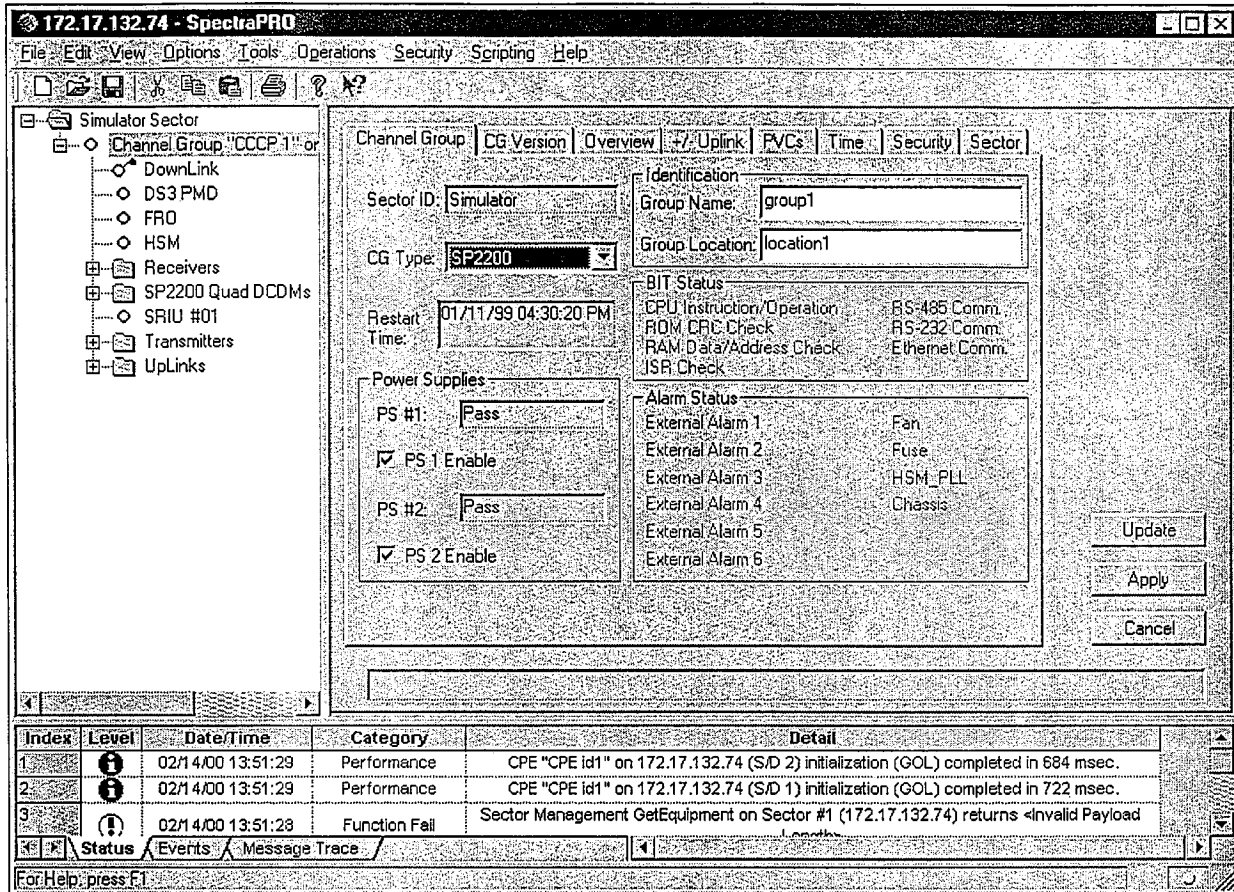


Figure 6. SpectraPRO Main BCG Window

Configuring a Base Station

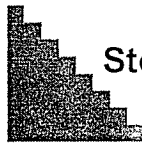
The first time a BCG is configured, SpectraPoint embedded software auto detects the equipment installed in the Base Station. The equipment initializes to its inactive state and set their parameters to default settings.

During the configuration process, the installer or operator uses SpectraPRO to set up and activate the following components using the parameters stated in the Installation Worksheet:

- Base Channel Group components:
 - PMD, page 16
 - FRO, page 19
 - HSM, page 21
 - DCDM, page 23
- SRIU, page 24;
- Transmitter(s), page 26
- Receiver(s) page 28.

Once you are logged in to the BCG, proceed as follows to set up the Sector equipment.

Setting Up Base Channel Group Components



Steps

1. In the Channel Group Main window Channel Group tab (see Figure 6), enter or set the parameters according to the Installation Worksheet. The following parameters are required.
 - a) Sector Identifier (North, East, West, or South)
 - b) CG Type
 - c) Channel Group Name (from Installation Worksheet)
 - d) Channel Group Location (from Installation Worksheet)
2. Click **Send**.
3. Select the Sector tab to display the Sector parameters (see Figure 7).

Num	RF Freq(m...)	LO Freq(m...)	IF Freq(mhz)	Data Rate(m...)	Viterbi Code Rat
1	27350	25880	950	32	1/2
2	28000	27050	1950	44	3/4

Figure 7. Sector Tab Display

4. In the Sector tab display, enter or set the parameters according to the Installation Worksheet. The following parameters are required.
 - a) Sector ID

- b) Sector Location
- c) Band Plan
- d) Transmitter Type

Activating the PMD



1. In the object tree pane, select the Channel Group object to display the Channel Group tabs.
2. Select the Overview tab to display the Overview graphic (see Figure 8).

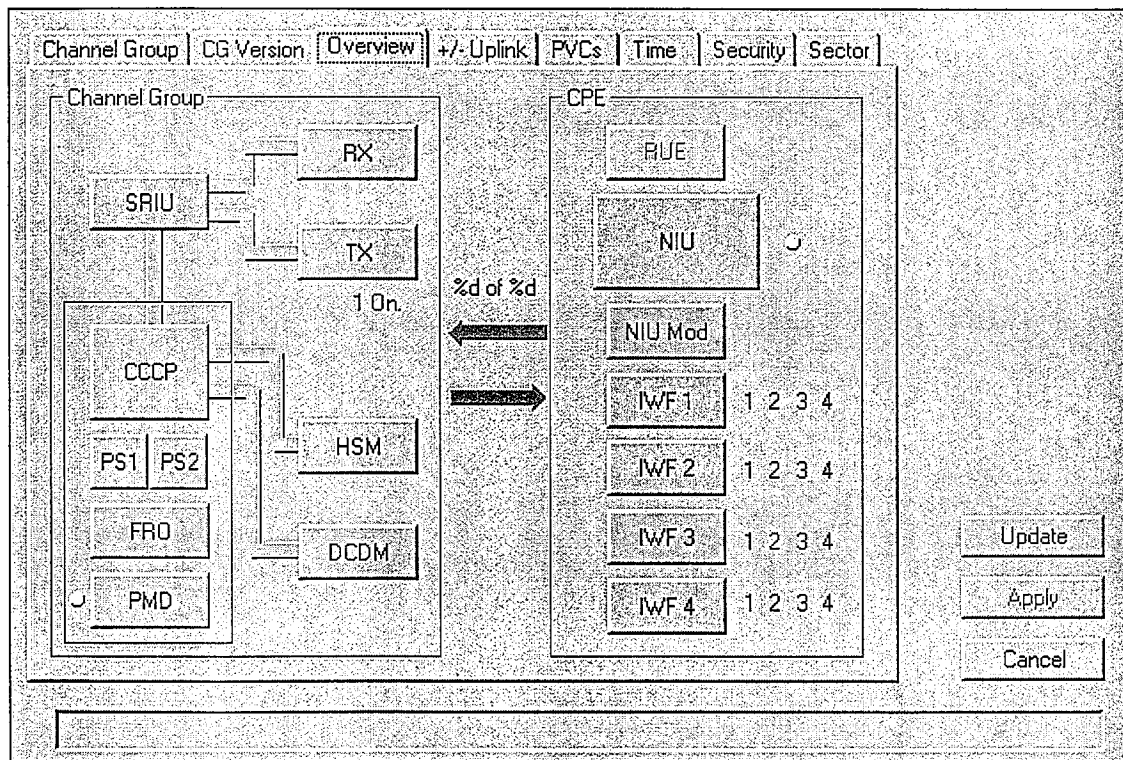


Figure 8. Channel Group Overview Tab

3. Double-click on the PMD icon to open the PMD window (see Figure 9).

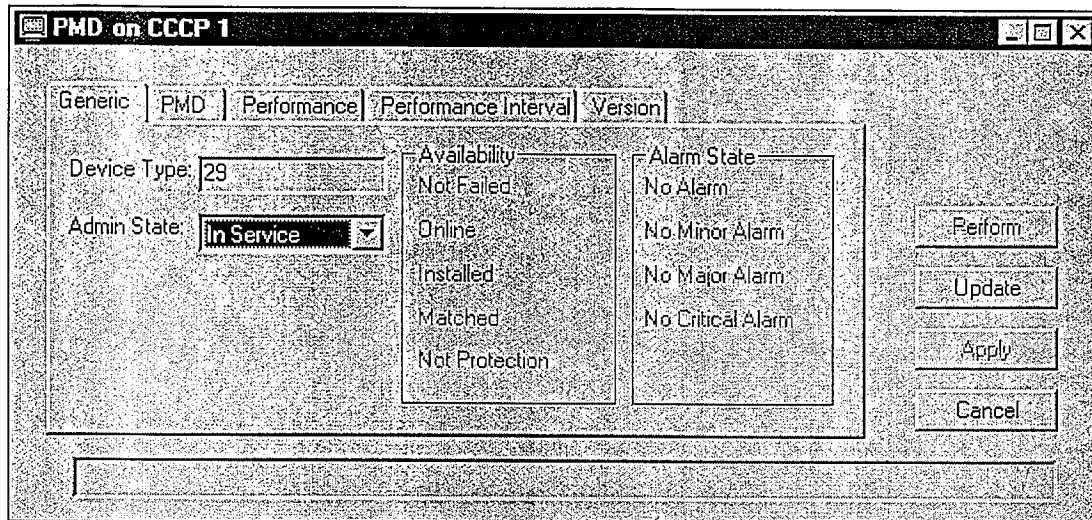


Figure 9. PMD Window

4. In the Generic tab display, select **In Service** from the Admin State drop-down list.
5. Click on the PMD tab, Figure 10, and enter the remaining required PMD parameters, as indicated in the Installation Worksheet.
 - a) Transmit Clock Source
 - b) Line Type
 - c) Line Coding
 - d) ATM Cell Delineation
 - e) Loopback

Activating the PMD

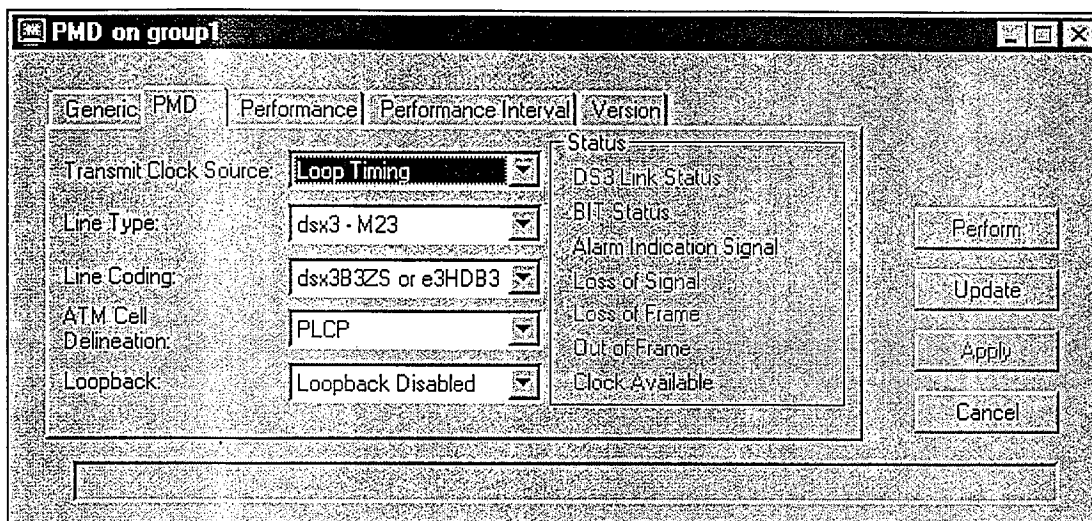


Figure 10. PMD Tab

6. Click Apply.
7. Click Cancel to close the window.

This completes the procedure for Activating the PMD.

Activating the FRO



1. In the object tree pane (see Figure 8), click the FRO icon to open the Reference Oscillator window (see Figure 11).

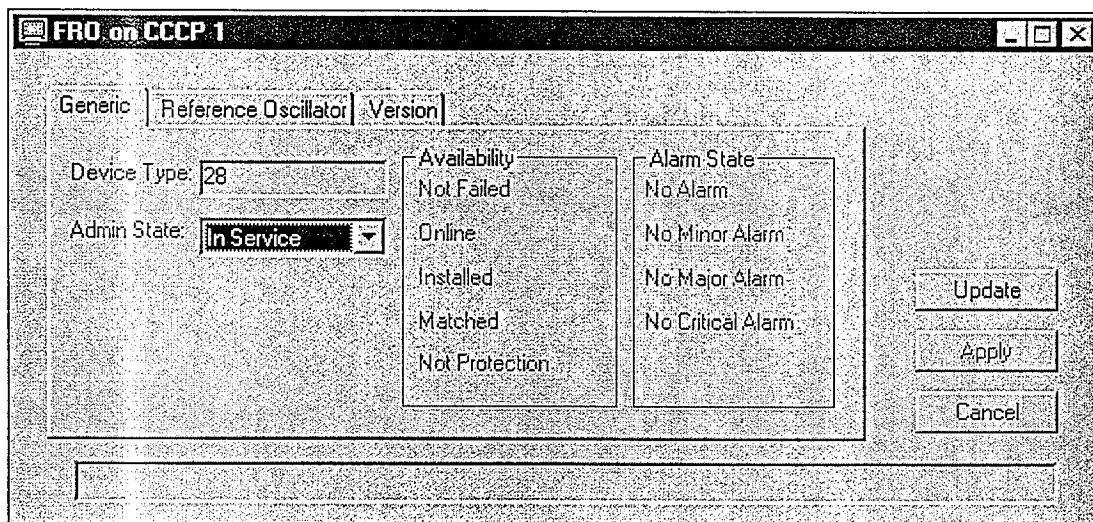


Figure 11. Reference Oscillator Window, Generic tab

2. Set the parameters according to the Installation Worksheet.
The following parameters are required.
 - a) Set Administrative State to **In Service**.
 - b) Select the Reference Oscillator tab (see Figure 12).
 - c) Set the Clock Source as indicated on the Installation Worksheet.
3. Click **Apply**.
4. Click **Cancel** to close the window.

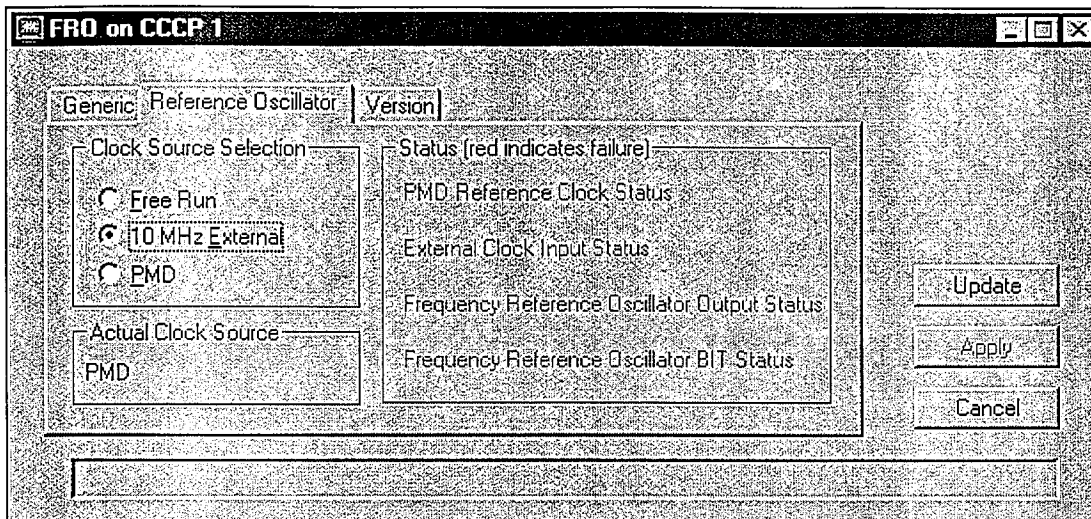


Figure 12. Reference Oscillator Window Reference Oscillator Tab

This completes the procedure for Activating the Frequency Reference Oscillator.

Activating the HSM



1. In the object tree pane (see Figure 8), double-click on High Speed Modulator/Upconverter to open the High Speed Modulator window Generic tab (see Figure 13).
2. Confirm or set the Admin State to **In Service**, and click **Apply**.

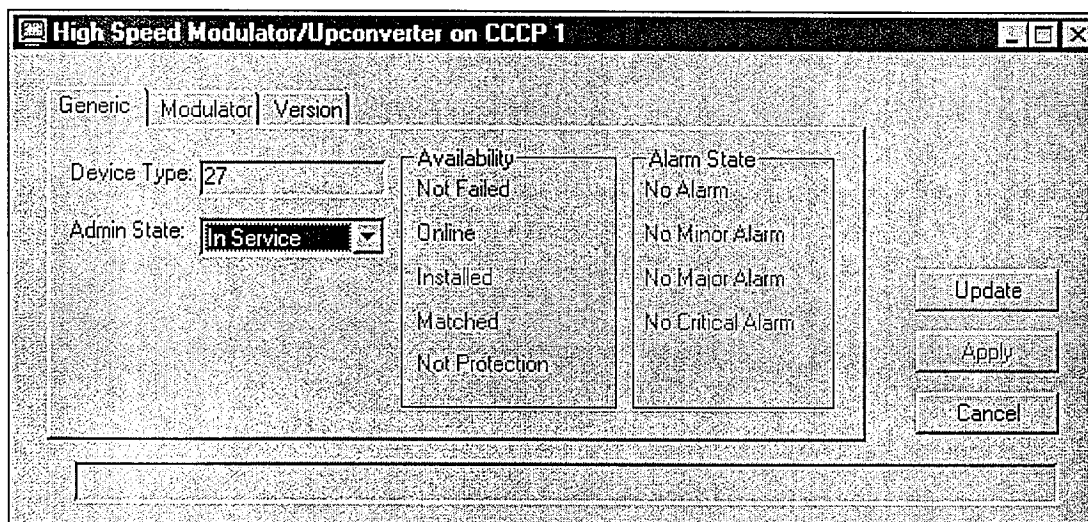


Figure 13. High Speed Modulator/Upconverter Window Generic Tab

3. Click on the **Modulator** tab.
4. If the Channel Group is the Primary Channel Group, enable Pilot Combined to L-Band Output, (see Figure 14).

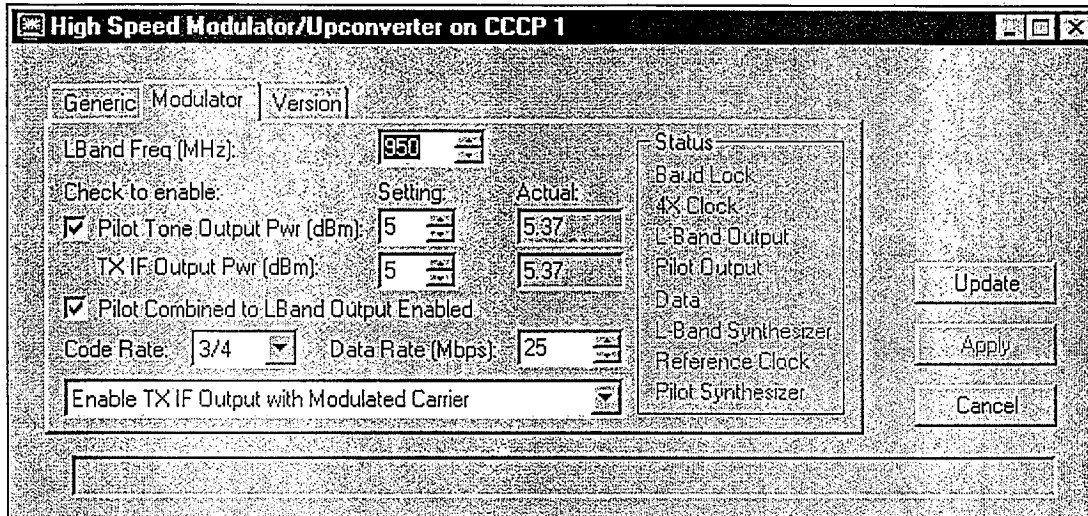


Figure 14. HSM Window Modulator Tab

5. Click **Apply**.

Note: The remaining parameters should remain at their default values unless the Work Order differs.

6. Click **Cancel** to close the High Speed Modulator window.

This completes the procedure for Activating the HSM.

Activating the DCDM



1. In the object tree pane, double-click on the DCDM icon to open the SP2200 Quad DCDM # window (see Figure 15).
2. Confirm or set the Admin State to **In Service**.
3. Click **Apply** to place the DCDM in service.

Note: All other DCDM parameters in this window remain at their default settings unless the Work Order indicates otherwise.

4. Click **Cancel** to close the window.

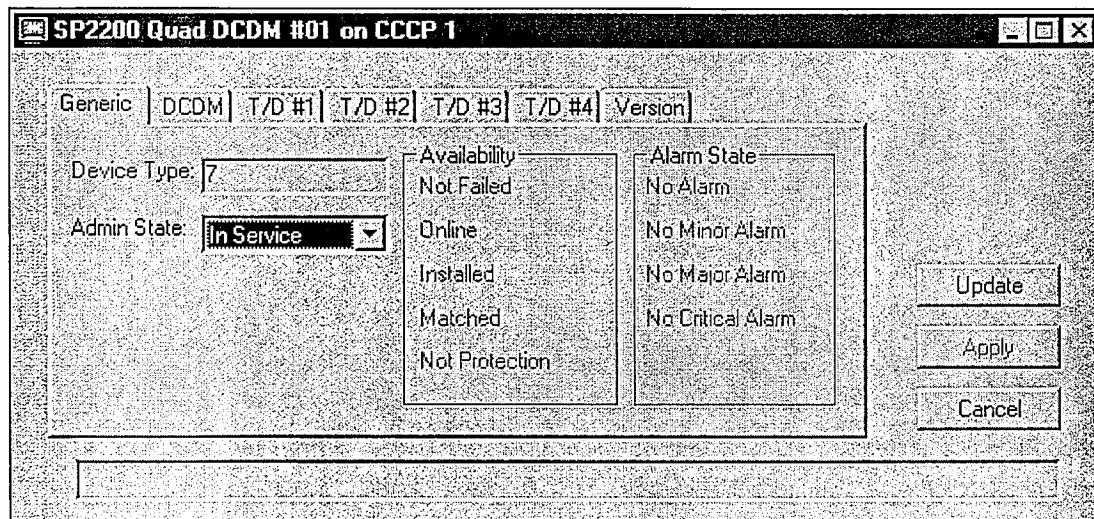


Figure 15. DCDM Window Generic tab

This completes the procedure for Activating the DCDM.

Note: Repeat the Channel Group Setup procedure for any additional DCDM to be activated.

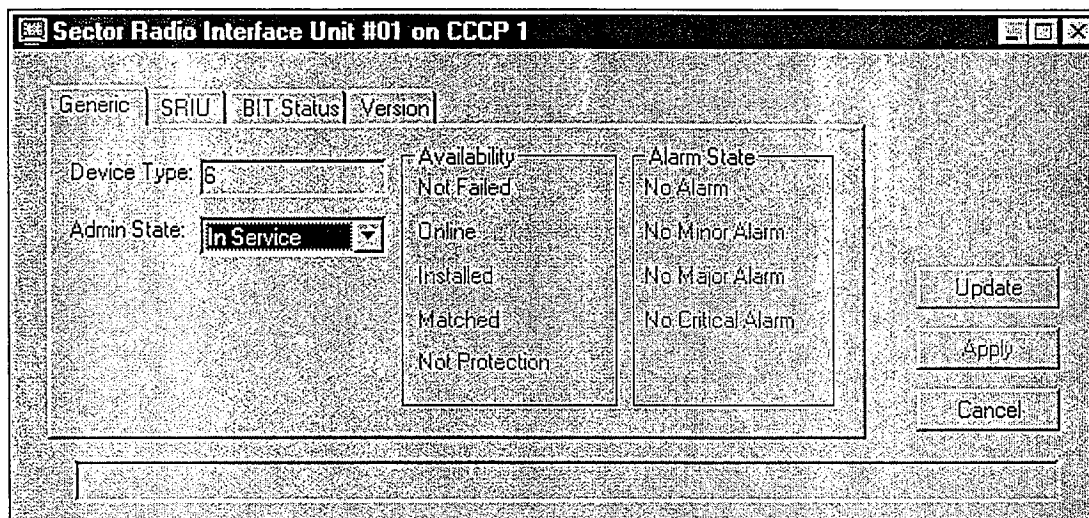


Figure 17. Sector Radio Interface Unit (SRIU) Generic Tab

2. Set the Admin State to **In Service**.
3. Click **Apply**.

Note: All other SRIU parameters remain at their default or previously changed settings unless the Work Order indicates otherwise.

4. Click **Cancel** to close the window.

This completes the procedure for Activating the SRIU.

Activating the Transmitter(s)



1. In the object tree pane (see Figure 16), double-click on the desired Solid State Transmitter to open the Solid State Transmitter Generic tab display (see Figure 18).
2. Set the Admin State to **In Service** and click **Apply**.

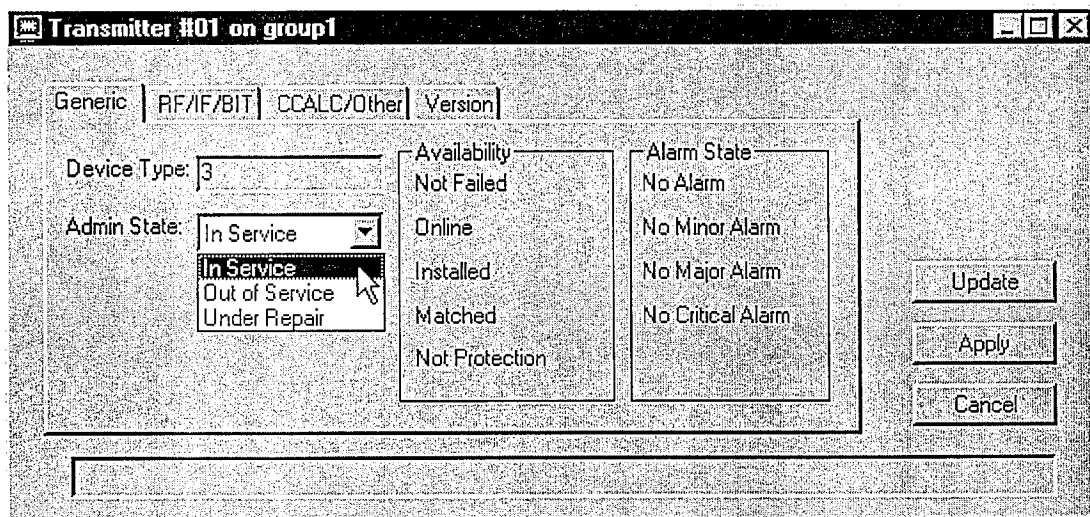


Figure 18. Solid State Transmitter Generic Tab

3. Select the CCALC/Other tab (see Figure 19).

The screenshot shows a software window titled "Transmitter #01 on group1" with a tabbed interface. The "CCALC/Other" tab is selected. The window contains several configuration fields and buttons. On the left, under "Type Information", "TX Type" is set to "Basic TX" and "Carrier Type" is set to "Revenue". Below this, "ALC Mode" is set to "ALC Disabled" and "RF Power Target Per Carrier" is set to "0" dBm. On the right, under "High Power Amplifier", "HPA Power Mode" is unchecked and "HPA Power State" is set to "On". Below this, "Carrier Count" is set to "1", "Fault" is unchecked, and "Switched TX #" is set to "8". On the far right, there are three buttons: "Update", "Apply", and "Cancel".

Tab	TX Type	Carrier Type	ALC Mode	RF Power Target Per Carrier	HPA Power Mode	HPA Power State	Carrier Count	Fault	Switched TX #
Generic									
RF/IF/BIT									
CCALC/Other	Basic TX	Revenue	ALC Disabled	0 dBm	<input type="checkbox"/>	On	1	<input type="checkbox"/>	8
Version									

Figure 19. Solid State Transmitter CCALC/Other Tab

4. Select the Transmitter Type (**Basic** or **High Gain**) according to the Installation Worksheet.
5. Set the ALC Mode to **Enabled**.
6. Click **Apply** to transmit the parameters to the transmitter.
7. Click **Cancel** to close the window.

This completes the procedure for Activating the Transmitter.

Activating the Receiver(s)



1. In the object tree pane (see Figure 16), double-click on the desired Receiver #xx to open the Receiver window Generic tab (see Figure 20).

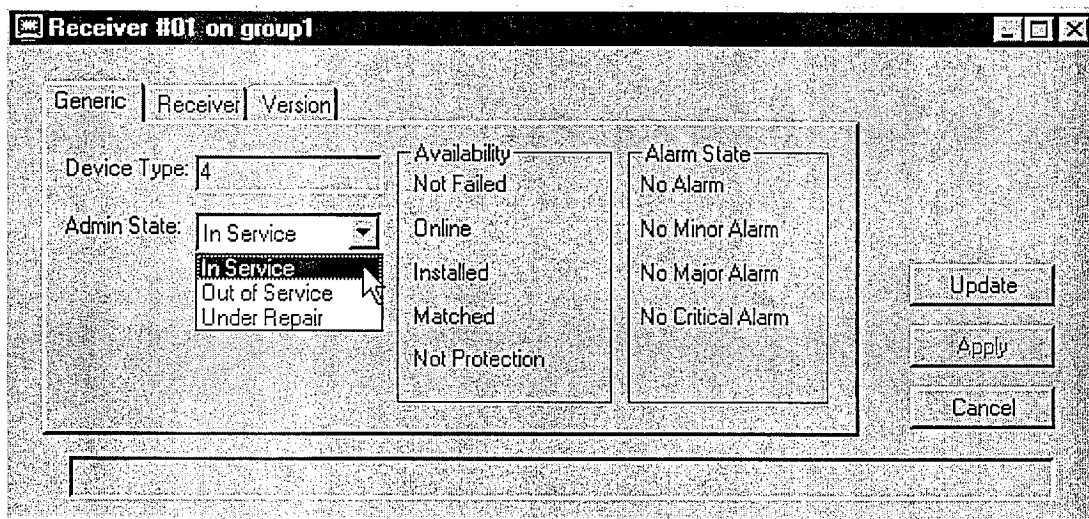


Figure 20. Receiver Window Generic Tab

2. Set the Admin State to **In Service**.
3. Click **Apply**.
4. Select the Receiver tab and set the IF Attenuation according to the Worksheet. The valid range is 0 to 20 dB (see Figure 21).

Receiver #01 on group1

Generic Receiver Version

RX Number: 1

RX Type: High-Gain RX

Address: 0x0081

IF Attenuation: 20 dB

LO Frequency: 25880 MHz

BIT Status

Temperature Power BIT

LO Lock LO Power Level

Digital Board Reset

Temp. Sensor Level: -128

Receiver Control: ☒ Fault LED: ☐

Update

Apply

Cancel

Figure 21. RX Window Receiver Tab

5. Set the IF Attenuation and LO frequency according to the Installation Worksheet.

Note: Repeat for the redundant Receiver, if used.

This completes the procedure for Activating the Receiver.

Installing Line Replaceable Items (LRIs)

This section covers software setup of newly installed SP2200 components using SpectraPRO software on the CID.

Note: For procedures for installing or replacing hardware, refer to the Installation and Maintenance sections.

A Base Station may require customization, upgrading, or repair during or following the initial installation. This section describes the LRIs which may be installed or replaced, and the software setup procedures required.

SP2200 LRIs

Base Channel Group LRIs

Base Channel Group

- Channel Controller/Cell Processor (CCCP) card
- Downconverter/Demodulator (DCDM) cards
- High Speed Modulator (HSM) card
- Frequency Reference Oscillator (FRO) card
- Power Supply cards
- Physical Medium Dependent (PMD) module

Node LRIs

Sector Radio Interface Unit (SRIU)

- SRIU Channel Cards
- 960 MHz Pilot/Local Oscillator Reference card
- RS-485 (Digital) card
- SRIU Power Supply cards
- SRIU Redundant Card, Version 1

SP2200 Basic or High Gain Transmitters

SP2200 Basic or High Gain Receivers

CPE LRIs

Rooftop Unit (RTU)

Network Interface Unit (NIU)

Interworking Function (IWF) cards

Configuring the Downlink

Before configuring a downlink, verify that the BCG components have been activated. See “Configuring a Base Station” on page 13 for more information.

The downlink is the signal from the BCG which is broadcast by a transmitter at the Node to up to 30 CPE sites, depending on the band plan. A Sector can transmit up to nine 40 MHz channels. Each channel is modulated by a single BCG.

The channels from all BCGs are combined at the Base and transported to the Node over a single coaxial cable. At the Node, the SRIU filters the channels from the signal and sends one, two or three channels to each transmitter for broadcast to CPEs in the Sector.

Channel frequencies are determined by the band plan for the locale. The first BCG is typically assigned the lowest available frequency, with successive BCGs assigned in 40 MHz increments above it. BCG Downlink Frequencies must be coordinated with the SRIU and the transmitters.

One BCG per Sector acts as the Primary BCG, providing Sector control functions for the auxiliary and backup BCGs. There may be up to eight auxiliary Channel Groups. An additional BCG can be configured as a redundant backup.

Setting the Downlink Parameters



1. Log into the desired Channel Group in the SpectraPRO object tree (refer to "Connecting the CID to a Base Channel Group" for login instructions.)
2. Click the + by the Channel Group to display the objects associated with it.
3. Select the desired Downlink to display the Downlink tab (see Figure 22).

Downlink

Parameters

Control Mode: RF Channel Number:

Primary Channel Group IP Address: Transmitter ID:

Link Type: Node Collocation:

Downstream RF Transmit Frequency (MHz): Downstream Data Rate (Mbps):

Downstream Viterbi Code Rate: Downstream Link State Control:

Downstream Link Status: Downstream Actual Transmit Power (dBm):

Network Interface Bandwidth (kbps)

VBR	<input type="text" value="511"/>	CBR	<input type="text" value="510"/>
Capacity	<input type="text" value="767"/>	Available	<input type="text" value="682"/>

Figure 22. Downlink Tab

4. Set the parameters according to the Installation Worksheet.
 - a) Downstream RF Transmit Frequency (Enter from Worksheet)
 - b) Control Mode (Select according to Worksheet)

- c) Node Collocation (Collocated for SP2200)
- d) Transmitter ID (Enter from Worksheet)
- e) Link Type (Default is Revenue)
- f) Downstream Viterbi Code Rate (Enter from Worksheet)
- g) Downlink Link State (On)

This completes the procedure for Setting the Downlink Parameters.

Verifying the Downlink Parameters



1. In the Object Tree pane, double-click the High Speed Modulator/Upconverter to open the High Speed Modulator/Upconverter window (see Figure 23).

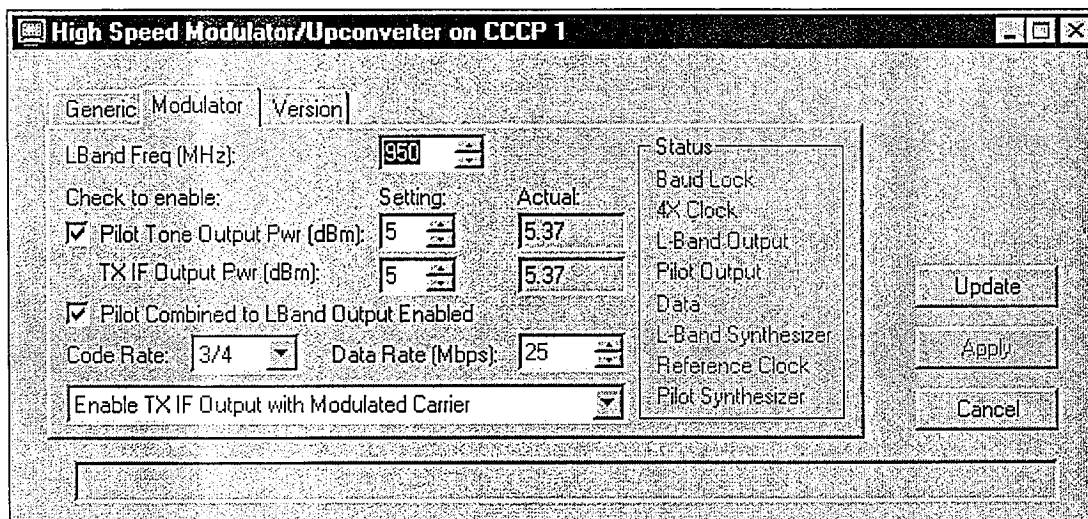


Figure 23. High Speed Modulator/Upconverter Window

2. Verify the Downlink setup by comparing the following parameter values against the Installation Worksheet:

Note: If the values do not match, return to Step 3 and repeat the setup process.

- a) L-Band Frequency (MHz)
 - b) Pilot Tone Output Pwr (dBm) enabling and power level setting
 - c) TX IF Output Pwr (dBm) power level setting
 - d) Pilot Combined to Band Output Enabled
 - e) TX Output Carrier Configuration from drop-down menu
3. In the Object Tree pane, double-click the transmitter assigned to this Base Channel Group to open the Solid State Transmitter window (see Figure 24).

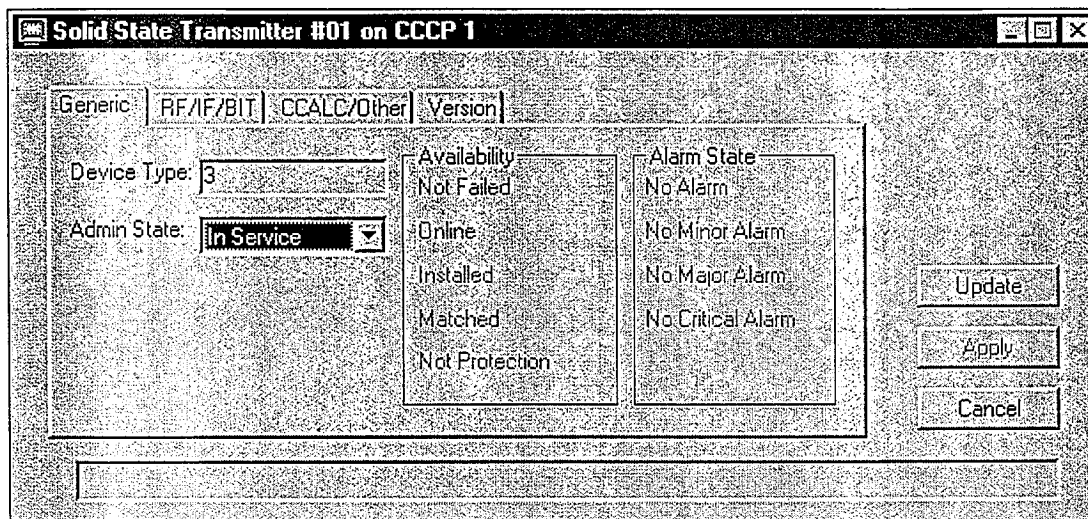


Figure 24. Solid State Transmitter Window Generic Tab

4. Verify the setup by comparing the following parameter values against the Installation Worksheet:

Note: If the values do not match, enter the correct values or return to Step 3 and repeat the setup process.

- Generic Tab
 - a) Admin State (set to In Service)
- RF/IF/BIT Tab
 - a) LO Frequency (MHz) (set frequency according to Worksheet)
 - b) IF BIT Threshold (set level according to Worksheet)
 - c) IF Attenuation (set level according to Worksheet)
 - d) IF Attenuation (set level according to Worksheet)
 - e) RF Power Target (set power level according to Worksheet)
 - f) RF BIT Threshold (set threshold according to Worksheet)

This completes the procedures for Verifying the Downlink Parameters and Bringing Up the Downlink.

Adding an Uplink

Uplink Description

An uplink in the SP2200 is one of a series of frequency allocations, one per CPE. The frequency for each uplink is determined by the Frequency Plan for the site, and is provided in the Installation Worksheet.

The customer's data rate is determined in the uplink settings. The total upstream data rate per Channel Group must not exceed 45 Mbps.



Attention

Changing the Upstream Frequency, Data Rate, or Viterbi Code Rate deletes the PVC and Services associated with the Uplink.

To change the uplink, delete the old uplink and its associated PVC and Services, and add a new uplink with PVCs and Services. Adding new services and PVCs can be simplified by using the same VPI/VCI on the new uplink.

Adding the Uplink



1. Log into the desired Channel Group in the SpectraPRO object tree (refer to "Connecting the CID to a Base Channel Group" for login instructions).
2. In the Object Tree Pane, double-click on the Channel Group to open the Channel Group window.
3. Select the +/- Uplink tab (see Figure 25).

Channel Group | CCCP Version | Overview | **+/- Uplink** | PVCs | Time | Security

List of Uplinks for Channel Group #1 (2 items)

Index	Name	Serial #	NIU ID	DCDM ID	Tuner/Dem...
1	Uplink Name1	SP2000-1	1	1	1
2	Uplink Name2	SP2000-2	2	2	2

Parameters

NIU Controller Serial #	<input type="text"/>	Uplink Name	<input type="text"/>
Upstream Transmit Frequency (MHz)	<input type="text"/>	Upstream Viterbi Code Rate	Undefined
Upstream Data Rate (Mbps)	<input type="text"/>	NIU ID	<input type="text"/>
DCDM ID	<input type="text"/>	Tuner/Demod ID	<input type="text"/>

Refresh List | Add | Remove | Defaults

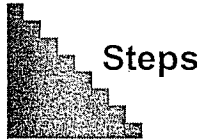
Figure 25. Add/Delete Uplink Tab in Channel Group Main Window

4. Click the **Defaults** button to display the default values.
5. Provision the uplink by Enter the following values.
 - a) NIU Controller Serial # (Enter from Worksheet.)
 - b) Upstream Transmit Frequency (MHz) (Enter from Worksheet.)
 - c) Upstream Data Rate (Mbps) (2.0 through 10.0. Enter from Worksheet.)

Adding the Uplink

- d) DCDM ID (Enter from Worksheet.)
 - e) Uplink Name (Text field. Enter from Worksheet.)
 - f) Upstream Viterbi Code (Enter from Worksheet. Default is 7/8.)
 - g) NIU ID (Integer 1 through 4, enter from Worksheet.)
 - h) Tuner/Demod ID
6. Click Add.
 7. Click Update and verify that the parameters are correctly entered.

Setting the Uplink Properties



1. In the Object Tree pane, select the newly added link in the Uplinks folder to open the Uplink Property Tab window (see Figure 26).
2. Verify that the changeable parameters in the Uplink Property tab are correctly set according to the Worksheet.

Property	Performance	PVCs	CPE	Tuner Demod	CPE Performance	CPE Version	Time
Identification for Uplink #1 Name: Uplink Name1 NIU Controller: SP2000-1 NIU ID: 1 DCDM ID: 1 Serial #: Tuner/Demod ID: 1							
Upstream States Link Acq. Status: Link Maintenance Link Avail Status: Available <input type="checkbox"/> Potential Rain Fade <input checked="" type="checkbox"/> Principal Channel Bias Enable <input checked="" type="checkbox"/> Transmit Power Ctrl <input type="checkbox"/> Try Principal Channel Bias Now				Upstream Parameters Target RF TX Freq (MHz): 28000 Actual RF TX Freq (MHz): 28000 Target Data Rate (Mbps): 2.0 Actual Data Rate (Mbps): 2.0 Viterbi Code Rate: 3/4			
Thresholds/Counter Frequency Drift (KHz): 70 Fade Counter: 100 (0.1 seconds) Es/No Thresholds for Code Rate (0.1 dB) Lower 1/2: 55 Lower 3/4: 82 Lower 7/8: 100 Upper 1/2: 95 Upper 3/4: 122 Upper 7/8: 140				Downstream Parameters Prime RF TX Freq: 27350 Prime Data Rate (Mbps): 45 Prime Viterbi Code Rate: 7/8 Bk 1 RF TX Freq (MHz): 27350 Bk 1 Data Rate (Mbps): 40 BK 1 Viterbi Code Rate: 3/4 Bk 2 RF TX Freq (MHz): 27350 BK 2 Data Rate (Mbps): 40 BK 2 Viterbi Code Rate: 3/4			
OTA Bandwidth (Kbps) Excess Per VBR Connection (bps): 26500 Total VBR: 10000 Total CBR: 10000 Capacity: 10000 Available: 10000							
<input type="button" value="Defaults"/>							

Figure 26. Uplink Window with Property Tab

3. Verify that the Uplink Property parameters are set according to the Installation Worksheet. The following parameters are required to initiate an Uplink.
 - a) Upstream Parameters/target RF TX Freq (MHz)
 - b) Target data rate (Mbps)
 - c) Viterbi Code Rate
4. Set the following fields to the indicated values.

Setting the Uplink Properties

Downstream Parameters

- a) Prime, Bk1, and Bk2 RF TX Freq (MHz)
- b) Prime, Bk1, and BK2 Data Rate (MHz)
- c) Prime, Bk1, Viterbi Code Rate

Upstream Status

- a) Uplink Name (Enter from Worksheet)
 - b) Link Acquisition (Enable)
 - c) Principal Channel Bias (Enable)
 - d) Transmit Power Control (Enable)
5. Click **Apply**.
 6. Click **Update** to verify the correct settings.
 7. Select the Tuner Demod tab and record the settings of the following parameter fields (see Figure 27).
 - a) Target L-Band Freq MHz
 - b) Target Data Rate
 - c) Viterbi Code Rate
 - d) Freq Drift Threshold kHz
 8. Verify that the Acquisition State displays Locked to Signal.
 9. In the Object Tree pane, double-click on the NIU Continuous Modulator to open the NIU SP2200 Continuous Modulator window (see Figure 28).

Property	Performance	PVCs	CPE	Tuner Demod	CPE Performance	CPE Version	Time
<div> <div> Downstream </div> <div> Target LBand Freq MHz: <input type="text" value="950"/> Actual LBand Freq MHz: <input type="text" value="950"/> Target Data Rate Mbps: <input type="text" value="25"/> Actual Data Rate Mbps: <input type="text" value="25"/> Verterbi Code Rate: <input type="text" value="3/4"/> </div> <div> Acquisition State: <input type="text" value="Locked to Signal"/> AGC Accum: <input type="text" value="8"/> DAGC Accum: <input type="text" value="9"/> Reset: <input type="text" value="No Action Taken"/> </div> </div>							
<div> <div> BIT Status </div> <div> Freq Drift Threshold: <input type="text" value="OK"/> AGC Saturated State: <input type="text" value="Not Saturated"/> DAGC Saturated State: <input type="text" value="Not Saturated"/> Carrier Lock State: <input type="text" value="Locked"/> </div> <div> Freq Drift Threshold kHz: <input type="text" value="4"/> Estimated Es/No dB: <input type="text" value="5"/> Freq Error kHz: <input type="text" value="515"/> </div> </div>							

Figure 27. Uplink Tuner/Demod Tab

NIU SP2200 Continuous Modulator #01 on CPE id1		
Generic	Continuous Modulator	Version
Device Type: <input type="text" value="37"/>	Availability: <input type="text" value="Not Failed"/>	Alarm State: <input type="text" value="No Alarm"/>
Admin State: <input type="text" value="In Service"/>	Online	No Minor Alarm
	Installed	No Major Alarm
	Matched	No Critical Alarm
	Not Protection	
		<input type="button" value="Update"/> <input type="button" value="Apply"/> <input type="button" value="Cancel"/>

Figure 28. NIU SP2200 Continuous Modulator Tab

10. Verify that the synthesizer lock status is "Pass."
 - a) If the lock status is "Pass," proceed to step 1.

- b) If the lock status is not "Pass," repeat the procedure.

This completes the procedure for Adding an Uplink.

Adding T-1 and E-1 Service

Once the Uplink is added, you can add service. This section provides procedures for adding T-1 and E-1 service. For procedures for adding Ethernet service, refer to the next section.

Adding a Permanent Virtual Circuit (PVC) for an IWF T-1 Port



1. In the Object Tree pane, select the Uplink to display the Uplink window (see Figure 26).
2. Select the PVCs tab to display the PVC fields (see Figure 29).

Property | Performance | **PVCs** | CPE | Tuner Demod | CPE Performance | CPE Version | Time

List of Virtual Circuits for uplink #1 (2 items)

VC Index	Network VPI/VCI	User VPI/VCI
1	001/00033	008/04257
2	002/00034	008/04258

Refresh List
Add
Remove
Defaults

CG Specific Parameters

Network VPI: []
Network VCI: []
Link Status: []
Backup Indicator: []

ATM Layer Statistics

☐ Refresh Statistics
AAL0... AAL5...

CG/CPE Common Parameters

DCDM ID: [] NIU ID: [] IWF Slot: [] AAL Type: AAL0 Delay VT: [] Service Category: other IWF QAM F5 Loopback Secs: [] Burst Size: [] QoS Level: []

OTA VPI: [] User VPI: []
OTA VCI: [] User VCI: []
OTA VCI: [] 12 LSBs: []
Cell Rates (kbps):
Peak: [] Sustain: [] Min: []

Figure 29. Uplink PVCs Tab

3. In the PVCs tab, click **Defaults**.
4. Set the PVC tab parameters as indicated in the Installation Worksheet. The following PVC parameters must be set to initiate the Uplink.
 - a) Enter Network VPI (Enter from Worksheet)
 - b) Enter Network VCI (Enter from Worksheet)
 - c) Set Link Status (Enable)
 - d) Select Backup Indicator (Principal or Backup from Worksheet)

- e) Select IWF Slot (1 – 5, from Worksheet)
 - f) Select IWF Port (1 – 4, from Worksheet)
 - g) Select AAL Type (AAL0 or AAL5, from Worksheet)
 - h) Select Service Category (CBR or UBR, from Worksheet)
 - i) Enter User VPI (from Worksheet)
 - j) Enter User VCI (from Worksheet)
 - k) Enter Peak Rate (from Worksheet)
 - l) Enter Avg Rate (from Worksheet)
 - m) Enter OAM F5 Loopback Seconds (from Worksheet)
5. Click **Add** to add the PVC.
 6. Click **Refresh List** to confirm that the PVC has been added with the correct parameters.
 7. Click the + next to the Quad CES T1 IWF X (where X is the value of the IWF slot in the PVCs window).
 8. If the PVC does not appear, repeat steps 2 through 7.

Adding Service to the T1 IWF Port



1. In the Object Tree pane Uplinks folder, click the + by the Quad CES T1 IWF to display the CPE Virtual Circuit (see Figure 26).
2. Select the CPE Virtual Circuit, then select the +/- CES tab (see Figure 30).

The screenshot shows the 'Property' window for a CPE Virtual Circuit, specifically the '+/- CES' tab. The window has several sections:

- VC/CES Identifiers:** Contains input fields for 'VC Index' (set to 1), 'IWF Slot #' (set to 2), 'CPE User VPI' (set to 8), 'IWF Port' (set to 1), and 'CPE User VCI' (set to 4257).
- Service:** A dropdown menu set to 'Structured'.
- T1 Time Slots:** A grid of 24 checkboxes, each labeled 'Slot' followed by a number from 1 to 24. All checkboxes are checked.
- Buttons:** On the right side, there are buttons for 'Defaults', 'Check All', 'Uncheck All', 'Add CES', and 'Remove CES'.

Figure 30. CPE Virtual Circuit +/- CES Tab

3. Set the parameters as indicated in the Installation Worksheet. The following PVC parameters must be set to initiate the Uplink.
 - a) Enter Network VPI (Enter from Worksheet)
4. Set the Service value to **Structured**.
5. Select the time slots indicated in the Installation Worksheet.
6. Click **Add CES**.
7. The CES Property and CES Performance tabs appear in the CPE Virtual Circuit window (behind the Property and +/- CES tabs).

- a) If they do not appear, repeat steps 3 through 7.
- 8. Select the CES Property tab.
- 9. Set Amin Status to **Up**.

This completes the procedure for Adding Service to the T1 IWF Port.

Provisioning Ethernet Service

PROCEDURE TO BE DEFINED

Changing Service

Once a BCG is operating, service can be changed using either SpectraPRO at the Base Station, or SpectraPoint EMS at the NOC. Service changes can include:

- Changing the bit rate
- Removing a link
- Adding service
- Removing service

Changing the Bit Rate



1. In the SpectraPRO Object Tree, click on the + next to the Uplinks folder. The Uplinks display.
2. Select the desired Uplink. The Uplink Window - Property tab displays.
***Note:** See "How to Connect the CID" and "How to Connect to the Channel Group" for more information on connecting and starting up SpectraPRO.*
3. Enter the Uplink Property tab parameters.
4. The following parameters are required:
 - a) Uplink Name
 - b) All Threshold settings
 - c) Principal Downstream Parameters
 - d) Backup 1 Downstream Parameters
 - e) Backup 2 Downstream Parameters
5. Click Apply to transmit the settings.
6. Click on the CPE Tab. The CPE tab displays.
7. Enter the CPE tab parameters.
8. The following parameters are required:
 - a) CPE Name
 - b) CPE Location
 - c) Tuner/Demod ID
 - d) All Parameters in the Upstream area
 - e) All Parameters in the Downstream area
 - f) Enable settings
 - g) Channel Group Name
9. Click Apply to transmit the settings.
10. Select the Tuner Demod Tab. The Tuner Demod tab displays.
11. Enter the Tuner Demod tab parameters.

- a) The following parameters are required:
 - b) Target L-Band Freq. MHz
 - c) Target Data Rate Mbps
 - d) Viterbi Code Rate
 - e) Freq Drift Threshold kHz
- 12. Click Apply to transmit the changes.
 - 13. Click Cancel to close the window.

Removing a Link



Steps

1. Log into the desired Channel Group in the SpectraPRO object tree (refer to "Connecting the CID to a Base Channel Group" for login instructions).
2. In the Object Tree Pane, double-click on the Channel Group to open the Channel Group window.
3. Select the +/- Uplink tab (see Figure 25).

Index	Name	Serial #	NIU ID	DCDM ID	Tuner/Dem...
1	Uplink Name1	SP2000-1	1	1	1
2	Uplink Name2	SP2000-2	2	2	2

Parameters

NIU Controller Serial # Uplink Name

Upstream Transmit Frequency (MHz) Upstream Viterbi Code Rate

Upstream Data Rate (Mbps) NIU ID

DCDM ID Tuner/Demod ID

Refresh List Add Remove Defaults

Figure 31. Add/Delete Uplink Tab in Channel Group Main Window

4. Click the Uplink Name to be Removed.
5. Click Remove.
6. Click Update and verify that the parameters are correctly entered.

Adding Service



1. In the Channel Group tab (see Figure 6), enter or set the parameters according to the Installation Worksheet. The following parameters are required.
 - a) Sector ID (North, East, West, or South)
 - b) CG Type
 - c) Channel Group Name (from Installation Worksheet)
 - d) Channel Group Location (from Installation Worksheet)
2. Click **Send**.
3. Select the Sector tab to display the Sector parameters (see Figure 7).

Num	RF Freq(m...)	LO Freq(m...)	IF Freq(mhz)	Data Rate(m...)	Viterbi Code Rat
1	27350	25880	950	32	1/2
2	28000	27050	1950	44	3/4

Figure 32. Sector Tab Display

4. In the Sector tab display, enter or set the parameters according to the Installation Worksheet. The following parameters are required.
 - a) Sector ID

Adding Service

- b) Sector Location
- c) Band Plan
- d) Transmitter Type

Removing Service



Steps

1. In the Channel Group tab (see Figure 6), enter or set the parameters according to the Installation Worksheet. The following parameters are required.
 - a) Sector ID (North, East, West, or South)
 - b) CG Type
 - c) Channel Group Name (from Installation Worksheet)
 - d) Channel Group Location (from Installation Worksheet)
2. Click **Send**.
3. Select the Sector tab to display the Sector parameters (see Figure 7).

Num	RF Freq(m...)	LO Freq(m...)	IF Freq(mhz)	Data Rate(m...)	Viterbi Code Rat
1	27350	25880	950	32	1/2
2	28000	27050	1950	44	3/4

Figure 33. Sector Tab Display

4. In the Sector tab display, enter or set the parameters according to the Installation Worksheet. The following parameters are required.
 - a) Sector ID

Removing Service

- b) Sector Location
- c) Band Plan
- d) Transmitter Type

Removing and Replacing Faulty Line Replaceable Items (LRIs)

To enable quick replacement and minimize down time, many replaceable circuit cards are hot-insertable and auto-discovered. However, some replacements require parameters to be reconfigured, or service to be re-established using SpectraPRO or SpectraPoint EMS software. This section will describe the procedures for setting up replacement LRIs and re-establishing service, where required.

Note: For procedures for installing or replacing hardware, refer to the Installation and Maintenance sections.

PROCEDURES TO BE DEFINED.

Viewing Performance Metrics

The SpectraPoint 2200 system can monitor and report performance parameters. To monitor the performance of a physical device or virtual object, double-click the item in the Object Tree to open the object's window(s).

Software Management

General

Embedded software determines the operation of the CCCP, Quad DCDM, and NIU controller cards in the SpectraPoint installation. Each controller card relies on a set of software images (such as a kernel, an application, and a database) to operate. The software images are stored in Flash RAM on each controller card.

A configuration table, also in Flash RAM, determines which software images are active when the board is restarted. As SpectraPoint software is improved, software images and configurations may be updated.

SpectraPRO software can access all of the controller cards in or controlled by the Base Channel Group SpectraPRO is logged into. This includes the CCCP and Quad DCDMs installed in the BCG as well as all of the NIU controllers at CPE locations served by the BCG. Using the SpectraPRO Software Management system, technicians can build sets of software for each type of controller, select multiple units which will receive the software, and then download, test, and commit the software.

Four features enhance the power and flexibility of the download process:

- One transfer command can download software images to multiple boards.
- Multiple sets of software, with multiple configurations, can be loaded onto each board.
- Software can be tested before it is committed as the default configuration; in case of error, the board reverts to the previous configuration on restart.
- The user can activate software on multiple boards with a single command.

Using these features greatly reduces the time required for downloading and implementing software on multiple units.

SpectraPRO Software Management uses the Pumpkin TFTP program (©1997, 1998 Klever Group, Inc.) as a TFTP server for file transfers. Pumpkin opens automatically when the user chooses Software Management from the Operation menu. Once open, it remains active to perform transfers in the background when needed.

Software Download GUI

The SpectraPRO Software Download main window is divided into three main areas, or panes (see Figure 34). At the top left is the List of Controllers. It displays all controllers of the type selected by the radio buttons above the field. At top right is the Load Configurations list. It displays the Load Configurations in the Flash RAM of the currently highlighted controller. At bottom, the Loaded Images list displays the software in the highlighted controller's Flash RAM.

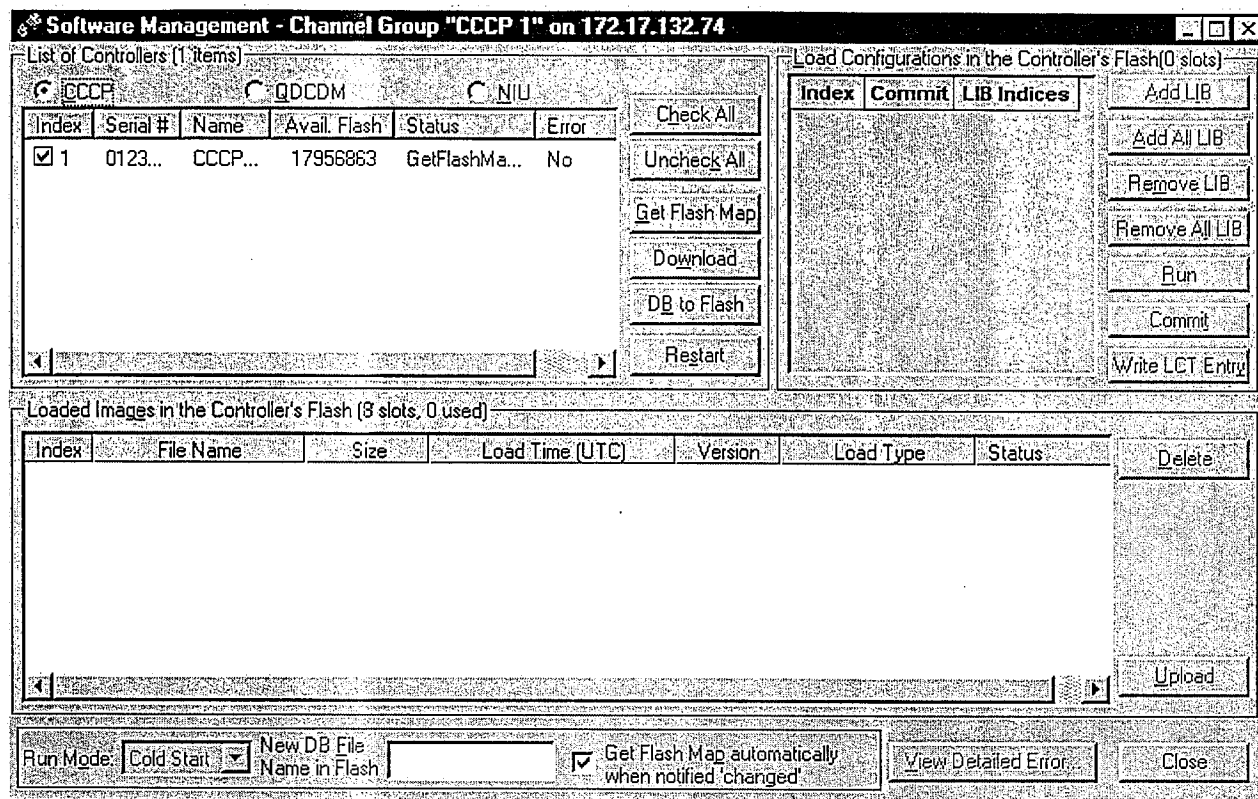


Figure 34. Software Download Main Window

List of Controllers

Radio buttons at the top of the pane determine what type of controller is displayed. Options are CCCP, QDCDM, and NIU.







Controllers may be selected in two ways: highlighted and checked. The highlighted controller is the unit whose data is displayed in the other two panes. Only one unit may be highlighted at a time.

Check boxes in the Index field indicate which controller cards will be the targets of any operations (downloads, restarts, flash map retrieval, etc.). The Software Download program operates on all controllers which are checked.

Other fields indicate each controller's serial number, the name given to the unit, the amount of Flash RAM available, and the Status and Errors. The status field shows the current status of the controller card, or the most recently executed command. The Error field displays a shorthand version of an Error report received from the controller. To view the complete error report text, select the errored controller and click the **View Detailed Error** button.

Select and operate on the controllers using the buttons to the right, as described in Table 3.

Table 3. Buttons for the *List of Controllers* Pane

Button	Result
	Checks all controllers in the List of Controllers. Operations are performed on all checked controllers.
	Unchecks all controllers in the List of Controllers.
	Retrieves the list of software and configuration files in the Flash RAM of the checked controllers.
	Opens the dialogs to download software to all checked controllers.
	Copies the database into Flash RAM with the name entered in the New DB File Name in Flash field.
	Restarts the checked controllers with the Committed load configuration.

Load Configurations in the Controller's Flash

The top right pane displays the Load Configurations currently loaded on the selected (highlighted) controller. Each Load Configuration field is expandable by dragging the divider bars up or down to view all of the software images in that configuration.

Click in the index field to select (highlight) a configuration. The configuration with the check mark in the Commit field will run on startup. Click the **Commit** button to commit the selected configuration. (If the Commit field is not displayed, use the slider at the bottom of the screen to display it.)

Modify the configurations using the buttons to the right, as described in Table 4.

Table 4. Buttons for the *Load Configuration* Pane




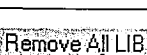
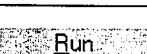


Button	Result
	Adds the selected software image in the bottom pane to the selected configuration.
	Adds all of the LIB files in bottom pane to the selected configuration.
	Removes the software image(s) from the configuration whose index numbers are selected in the LIB Indices list.
	Removes all software image(s) from the configuration selected in the LIB Indices list.
	Runs the configuration of software in the selected index on each checked controller.

Table 4. Buttons for the *Load Configuration Pane* (Continued)



Button	Result
	Selects the configuration in the Load Configurations list which will be the default configuration on startup.
	Writes the selected configuration to the same Load Configuration index on all of the selected controllers.

Loaded Images in the Controller's Flash

The bottom pane displays the software images currently loaded on the selected (highlighted) controller in the List of Controllers. Software images may include applications, kernels, and databases. Images must be downloaded to the controller before they can be added to a configuration or run.

Modify the software loaded on the controller using the buttons described in Table 5.

Table 5. Buttons for the *Loaded Images in the Controller's Flash Pane*

Button	Result
	Deletes the selected software image from the controller's Flash RAM.
	Opens the dialogs to upload the selected software from the controller to the CID or other location.

Other Fields and Controls

Additional fields and controls across the bottom of the window are described in Table 6.

Table 6. Additional Fields and Buttons


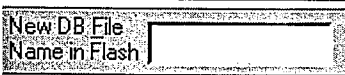



Button	Result
	Reserved for future use.
	The file name for a database to be copied to Flash RAM.
	Automatically retrieves the Flash Map of the checked controllers when notified of a change in the Flash Map. The response overwrites any previous entry in the List of Controller's Status field, so it should be turned off (unchecked) for troubleshooting.

Table 6. Additional Fields and Buttons (Continued)

Button	Result
	Displays the full text of the error currently indicated in the Error column for the selected controller.
	Closes the Software Management window.

Working with Multiple Controllers

The Software Download program can operate on several controllers at once. This allows the technician to download software to, run software on, or commit configurations on multiple controllers at once. Click on the controllers to be operated on to display a check mark in the Index column (see “Checks,” Figure 35). Clicking again un-checks (de-selects) the controller.

Operations will be performed on all controllers which are checked.

The Software Download program displays the load configurations and software images residing in the highlighted controller's Flash RAM. Highlight a controller by clicking on its entry in the List of Controllers (see “Highlighting,” Figure 35).

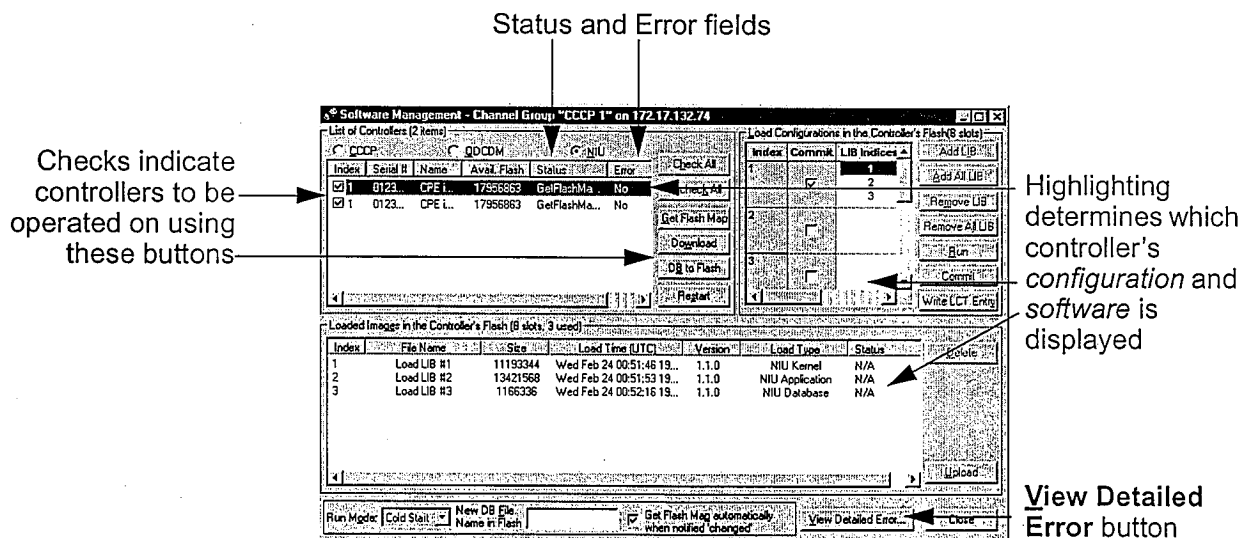


Figure 35. Software Management GUI

Software Download Process

Overview

Downloading software to a controller involves the following steps, which are explained in detail in the following sections:

- “Connecting, Logging In, and Running Software Management”
- “Downloading Software”
- “Building and Writing a Configuration”
- “Testing the Software by Running from Flash”
- “Committing the Configuration and Restarting”

The procedure for uploading software from Flash RAM to the CID is described at the end in “Uploading Software.”

Connecting, Logging In, and Running Software Management



1. Connect the CID and start SpectraPRO as directed in "Connecting the CID to a Base Channel Group."
2. Log into the desired Channel Group.
3. With the desired controller selected, select **Software Management...** from the Operations menu (see Figure 36) to open the Software Management dialog.

Note: Opening Software Management also starts the Pumpkin TFTP program, which runs in the background and performs file transfer functions.

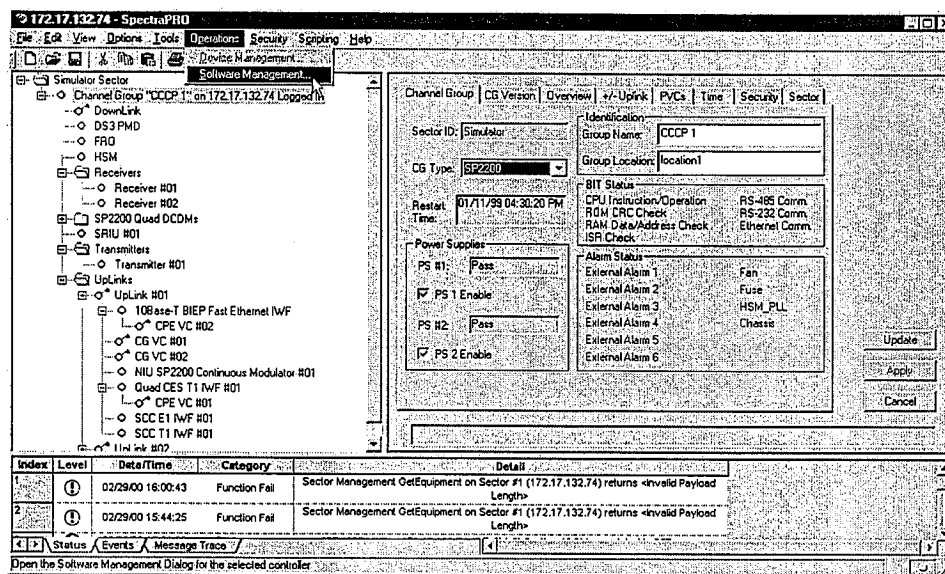



Figure 36. Operations Menu Software Management selection

4. If the Pumpkin window opens, click the X in the top right corner to close the window. This leaves the program running in the background (see Figure 37).

Note: Do not click the Exit button. If the application is not running, as indicated by its icon  in the Windows task bar, restart it as follows. Close the Software Management window. Restart Software Management by selecting **Operations> Software Management**. Pumpkin also starts and its icon appears in the Windows system tray.

This completes the procedure for Connecting, Logging In, and Running Software Management.

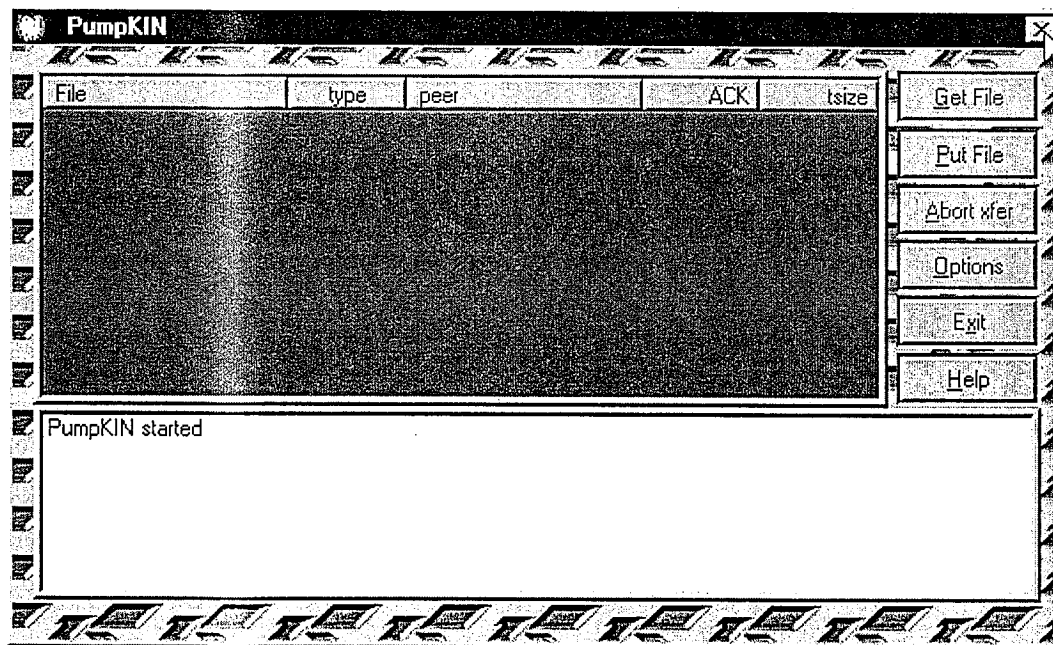


Figure 37. Pumpkin TFTP Client Close Button

Downloading Software

Only one file may be downloaded at a time, but it may be downloaded onto multiple controllers.



Steps

1. In the Software Management window, click one of the three radio buttons at the top left to select the type of controller to be updated.

Note: Choices are CCCP, QDCDM, and NIU. The Software Manager displays a list of available targets of the selected controller type (see Figure 38).

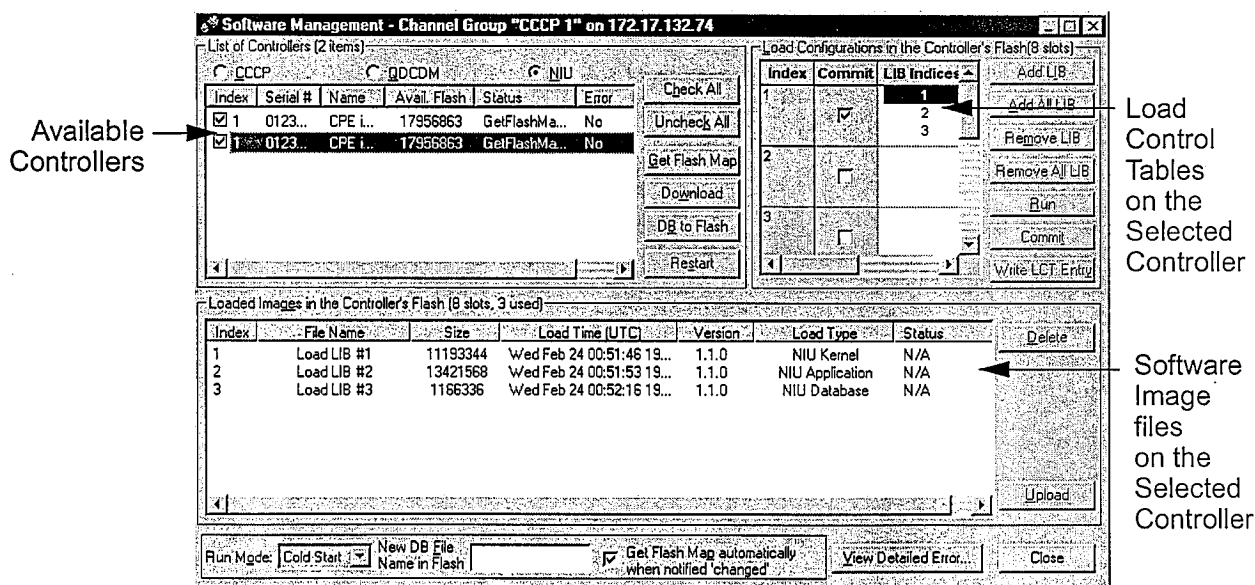


Figure 38. Software Management Window

2. Select (highlight) the first controller which is to receive new software by clicking on it in the List of Controllers.
 - The right pane, titled Load Configurations, displays the configurations on the selected controller.
 - The bottom pane, titled Loaded Images in the Controller's Flash, displays the software which is currently on the highlighted controller.
3. Click on the controller in the List of Controllers until the check box in the Index column is checked.

4. Repeat Steps 2 through 3 for each controller you want to download this software to.
5. Review the controllers in the List of Controllers to verify that all of the desired controllers, and none of the undesired controllers, are checked.
6. Click the **Download** button to the right of the List of Controllers pane. The Software Download/Upload Parameters window appears (see Figure 39).

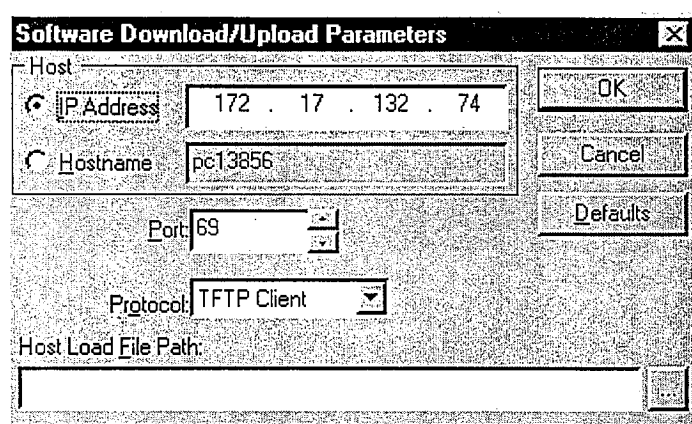



Figure 39. Software Download/Upload window

7. Enter the Host Load File Name.

Note: Do not enter a path in this field. If the path to the desired software differs from the default path, enter the correct path in Pumpkin as follows.

- a) Open Pumpkin by clicking the Pumpkin icon  in the system tray.
 - b) Click the **Options** button.
 - c) Enter the path and filename in **TFTP File System Root (download path)**.
 - d) Click OK.
8. If required, enter the IP Address or Hostname, Port and Protocol.
 - Typically, the defaults for the remaining parameters should be correct if the file to be loaded is on the same PC (the CID) as the SpectraPRO Software Management software.

**Attention**

You are about to download the software to all of the controllers with check marks in their index fields. If necessary, verify that the correct controllers are chosen by repeating Step 5.

9. Click **OK**.

Note: If the Pumpkin TFTP program is not running, the download will not proceed and an error will appear in the Status & Events pane Status tab. To re-start Pumpkin, close the Software Management window, then restart Software Management by selecting **Operations> Software Management**. Pumpkin will also restart and its icon will appear in the Windows system tray.

10. In the confirmation screen, click **Yes**. When the download is complete, the file will appear in the Loaded Images in the Controller's Flash pane at the bottom.

This completes the procedure for Downloading Software.

Building and Writing a Configuration

A configuration file can only include software image files in the controller's Flash RAM. The Software Management program displays the eligible files for the selected controller in the bottom pane.



Steps

1. Select a Load Configuration Index in the top right pane (see Figure 40).
 - If no empty Indexes are available, select an unused configuration and click **Remove All Lib**.

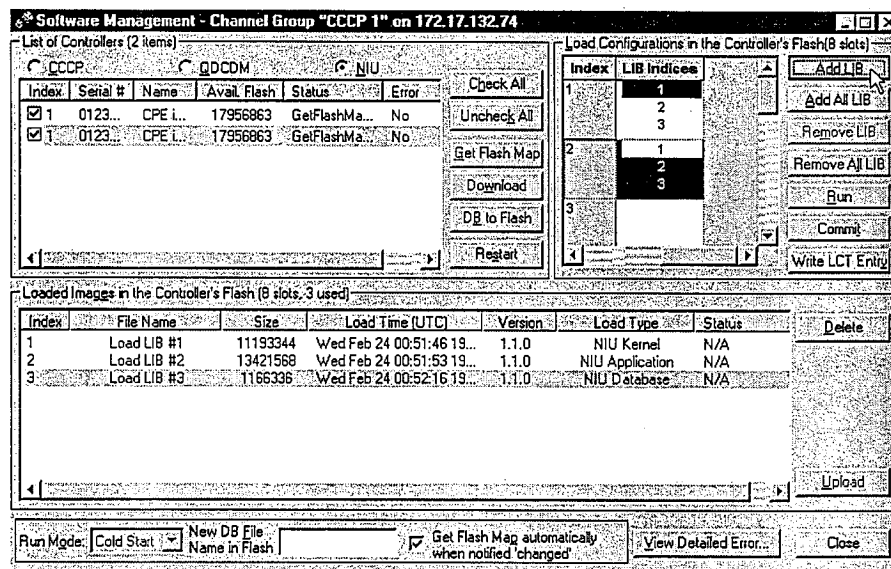


Figure 40. Load Configurations

2. In the bottom pane, select a file to be included in the Load Configuration and click **Add LIB**, as shown in Figure 40.
3. Repeat for each file to be added until all desired files are added to the Load Configuration.
4. Select the controllers to receive this configuration by clicking in the index column to display a check mark by each desired controller.

***Note:** This procedure will download the selected configuration to every controller which has a check mark in its index column.*

5. Click **Write LCT Entry**.

This completes the procedure for Building and Writing a Configuration.

Testing the Software by Running from Flash

Before committing the new configuration as the default software on startup, test the software as follows.



Steps

1. Select the controllers on which to test the new configuration by clicking the check box in the List of Controllers (top left pane).

Note: This procedure will run the configuration in the selected index on every controller which has a check mark in its index column.

2. Select the Index of the desired Load Configuration in the Load Configurations in the Controller's Flash pane (top right).
3. Click **Run**, then confirm the action by clicking **Yes** in the Software Management dialog.

Note: Clicking **Run** causes each checked controller to run the Load Configuration on that controller in the selected index. The load configuration in the chosen index (i.e., index number 2) may include different software on each controller.

4. If there are errors in the Status and Error columns of the List of Controllers, select each errored controller and click **View Detailed Error...** to help resolve the problem.
5. When the new configurations run without error on all controllers, proceed to "Committing the Configuration and Restarting."

This completes the procedure for Testing the Software by Running from Flash.

Committing the Configuration and Restarting

Loading a configuration into Flash does not commit that configuration. When the controller is restarted, it will revert to the committed configuration in the Load Configurations list. Only one configuration may be committed.



1. Click to check the desired controller(s) in the List of Controllers.
2. Click to select a Load Configuration in the Load Configurations list.

Note: The configuration in the selected index on each controller will be committed, even if the configurations differ, i.e., if configuration number 3 is selected, that configuration will be committed on all checked controllers, even though the Load Images in configuration 3 differ from controller to controller.
3. Click **Commit**. The configuration in the selected index on all checked controllers is now the default configuration on startup.
4. Click **Restart** to restart the checked controllers.
5. When the controllers have restarted, verify that no errors are indicated in the Status and Error columns in the List of Controllers.
 - If errors exist, select each errored controller and click **View Detailed Error...** to help resolve the problem.

This completes the procedure for Committing the Configuration and Restarting.

Uploading Software

To copy software from one Flash RAM to others, you must first upload the software to the CID or another location. Then, you can use the “**Connecting, Logging In, and Running Software Management**” procedure to download it to other controllers. The following procedure provides the steps to upload software from a device’s Flash RAM.



1. In the Software Management window List of Controllers pane, click to highlight the desired controller to upload from. The software loaded in that device’s Flash RAM displays in the Loaded Images pane at the bottom.
2. Select one or more software images to upload.
3. Click the **Upload** button to the right of the bottom pane.
4. In the Software Download/Upload Parameters screen, enter the name of the file in the Host Load File Path (or browse for the location using the ... button).
5. Click **OK**.
6. If the information in the Software Management confirmation screen is correct, click **Yes**.

This completes the procedure for Uploading Software.